APPENDIX 1

```php
#!/usr/bin/php -q
<?

require("/home/scopeuser/production/include_prefs.php");
$GLOBALS["ini_config"] = $ini_config;

$path = "/var/www".$GLOBALS["ini_config"]["webpath"];
chdir($path);

require("./libs/phpmailer/class.phpmailer.php");
require("./elements/metrics_generation.inc");
require("./elements/graphing/line_plot.inc");
require("./elements/timezone.inc");


//Connect to database
mysql_connect($ini_config["hostname"],$ini_config["db_user"],$ini_config["db_password"]) or die("Unable
to connect to the database");
mysql_select_db($ini_config["database"]) or die("Unable to select database");


class Message
{
        var $elements;
        var $recipient;
        var $notification_type;
        var $timezone_offset;

        function init($elements, $recipient, $notification_type) {
                $this->elements = $elements;
                $this->timezone_offset = get_timezone_offset($this->elements["user_id"], $this-
>elements["user_server_id"]);
                $this->recipient = $recipient;
                $this->notification_type = $notification_type;
        }

        function build()
        {
                $this->elements["graphing_file"] = "line_plot";
                if ($this->notification_type == 'email') {
                        $this->build_email();
                }
                elseif ($this->notification_type == 'page') {
                        $this->build_page();
                }


        }
        function graph_gen() {

                $metrics_dict = Array();
                $metrics_dict["hour_from"] = 0;
                $metrics_dict["hour_to"] = 24;
                $metrics_dict["divisor"] = $this->elements['divisor'];
                $metrics_dict["legend"] = 1;
                $metrics_dict["xgrid"] = 1;
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            $metrics_dict["ygrid"] = 1;
            $metrics_dict["items_to_graph"] = array($this->elements["monitor_id"]);
            $metrics_dict["mdr"] = 1;
            $metrics_dict["watermark"] = 1;
            $metrics_dict["view_type"] = "last_24";
            $metrics_dict["timezone_offset"] = $this->timezone_offset * -1;
            $timestamps = timestamps_last24($metrics_dict['timezone_offset'], $this-
>elements['event_log_timestamp']);
            $metrics_dict['timestamp_from'] = $timestamps[0];
            $metrics_dict['timestamp_to'] = $timestamps[1];
            $metrics_dict["generated_timestamps"] = generate_timestamps($metrics_dict);

            $metrics_dict['plot_file'] = $this->elements["plot_type"].".php";

            # Process Results Of The Last 24 Hours for the Metric
            $results_data = process_results($metrics_dict, $this->elements);
            $this->elements['adjusted_unit'] = $results_data[1];
            # Generate Graph
            $gcid = line_plot($metrics_dict, $this->elements, $results_data);
            $event_log = generate_event_log($metrics_dict, $this->elements);

            return Array($gcid, $event_log);
        }

        function build_page()
        {
            // build the 120 char text body
            $page_char_max = 120;
            if ($this->elements["metric_type"] == "tunnel") {
                $dividable = 2;
                $this->page_body = $this->elements["verdict"].":".$this-
>elements["tunnel_alias"]."-".$this->elements["tunnel_entry_alias"]."-".$this->elements["metric_name"];
                if (sizeof($this->page_body) > $page_char_max) {
                    $excess = sizeof($this->page_body - $page_char_max);
                    $per_item = $excess / $dividable;
                    $this->page_body = $this->elements["verdict"].":".substr($this-
>elements["tunnel_alias"], 0, (-1 * $per_item))."-".substr($this->elements["tunnel_entry_alias"], 0, (-1 *
$per_item))."-".$this->elements["metric_name"];
                }
            }
            elseif ($this->elements["metric_type"] == "interface") {
                $dividable = 2;
                $this->page_body = $this->elements["verdict"].":".$this-
>elements["device_alias"]."-".$this->elements["interface_alias"]."-".$this->elements["metric_name"];
                if (sizeof($this->page_body) > $page_char_max) {
                    $excess = sizeof($this->page_body - $page_char_max);
                    $per_item = $excess / $dividable;
                    $this->page_body = $this->elements["verdict"].":".substr($this-
>elements["device_alias"], 0, (-1 * $per_item))."-".substr($this->elements["interface_alias"], 0, (-1 *
$per_item))."-".$this->elements["metric_name"];
                }
            }
            elseif ($this->elements["metric_type"] == "vip") {
                $dividable = 2;
                $this->page_body = $this->elements["verdict"].":".$this-
>elements["device_alias"]."-".$this->elements["vip_alias"]."-".$this->elements["metric_name"];
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                    if (sizeof($this->page_body) > $page_char_max) {
                            $exceed = sizeof($this->page_body - $page_char_max);
                            $per_item = $exceess / $dividable;
                            $this->page_body = $this->elements["verdict"].":".substr($this-
>elements["device_alias"], 0, (-1 * $per_item))."-".substr($this->elements["interface_alias"], 0, (-1 *
$per_item))."-".$this->elements["metric_name"];
                    }
            }
            elseif ($this->elements["metric_type"] == "device") {
                    $dividable = 1;
                    $this->page_body = $this->elements["verdict"].":".$this-
>elements["device_alias"]."-".$this->elements["metric_name"];
                    if (sizeof($this->page_body) > $page_char_max) {
                            $excess = sizeof($this->page_body - $page_char_max);
                            $per_item = $excess / $dividable;
                            $this->page_body = $this->elements["verdict"].":".substr($this-
>elements["device_alias"], 0, (-1 * $per_item))."-".$this->elements["metric_name"];
                    }
            }
    }
    function build_email()
    {
            // generate plot
            list($this->gcid, $this->event_log) = $this->graph_gen();

            // url for image source
            $url = $GLOBALS["ini_config"]["url"];


            // build the text and html email subjects and bodys
            if ($this->elements["metric_type"] == "tunnel") {
                    $details = Array (
                            Array("Tunnel Alias", $this->elements["tunnel_alias"]),
                            Array("Tunnel Entry Alias", $this->elements["tunnel_entry_alias"]),
                            Array("Metric", $this->elements["metric_name"]),
                            Array("System Message", $this->elements["msg"])
                    );
            }
            elseif ($this->elements["metric_type"] == "interface") {
                    $details = Array (
                            Array("Device Alias", $this->elements["device_alias"]),
                            Array("Interface Alias", $this->elements["interface_alias"]),
                            Array("Metric", $this->elements["metric_name"]),
                            Array("System Message", $this->elements["msg"])
                    );
            }
            elseif ($this->elements["metric_type"] == "vip") {
                    $details = Array(
                            Array("Device Alias", $this->elements["device_alias"]),
                            Array("VIP Alias", $this->elements["vip_alias"]),
                            Array("Metric", $this->elements["metric_name"]),
                            Array("System Message", $this->elements["msg"])
                    );
            }
            elseif ($this->elements["metric_type"] == "device") {
                    $details = Array (
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                                        Array("Device Alias", $this->elements["device_alias"]),
                                        Array("Metric", $this->elements["metric_name"]),
                                        Array("System Message", $this->elements["msg"])
                        );
        }

        $formatted_details = "";

        foreach ($details as $detail) {
                $formatted_details = $formatted_details.$detail[0].":        ".$detail[1]."\n";
        }
        $this->text_body = sprintf(
                "%s Alert Detected

------------
%s",

                        ucwords($this->elements["verdict"]),
                        $formatted_details

        );

        if ($this->elements["verdict"] == "OK") {
                $verdict_clean = "Recovery";
        }
        else {
                $verdict_clean = "Error";
        }
        $formatted_details = '<table align="center" bgcolor="#F8F8F8">';
        foreach ($details as $detail) {
                $formatted_details = $formatted_details.'<tr><td
align="right">'.$detail[0].":</td><td><b>".$detail[1]."</b></td></tr>";
        }
        $formatted_details = $formatted_details."</table>";
        $this->html_body = sprintf('
<html>
        <head>
                <link rel="stylesheet" type="text/css" href="%sips_ccv2.css"/>
                <title>IP Sciences - Notifications - Alert</title>
        </head>
        <body bgcolor="#ffffff" marginheight=40 marginwidth=0 topmargin=40 leftmargin=0>
                <div
                        align="center"
                        style="border:1px solid #000; margin-height:0px; margin-left:5px; margin-
right:5px; margin-top:0px; width:100%%; height:100%%">
                        <table
                                style="width:100%%;height:100%%"
                                summary="main layout"
                                bgcolor="#ffffff"
                                border="0"
                                cellpadding="0" cellspacing="0">
                        <tr style="height:24">
                                <td width="182" valign="top" height="24"
background="%sgraphics/hdr_orange_ban.gif">
                                        <img alt="_" src="%sgraphics/dot_clear.gif" width="182"
height="24" border="0"/>
                                </td>
                                <td width="1" valign="top" height="24">
                                        <img alt="_" src="%sgraphics/dot_clear.gif" width="2"
```

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height="24" border="0"/>
                                                </td>
                                                <td valign="top" width="100%%" bgcolor="#3c60aa" align="center"
height="24">
                                                        <img alt="_" src="%sgraphics/stmt_geni.gif" border="0"/
height="24">
                                                </td>
                                        </tr>
                                        <tr>
                                                <td valign="top" bgcolor="#ffffff">
                                                        <img alt="ips logo" src="%sgraphics/ipslogo_cut.jpg"
border="0"/>
                                                </td>
                                                <td width="1" valign="top">
                                                        <img alt="_" src="%sgraphics/dot_clear.gif" width="2"
border="0"/>
                                                </td>
                                                <td valign="top" width="100%%">
                                                        <table width="100%%" bgcolor="#888895" border="0"
cellpadding="0" cellspacing="0">
                                                        <tr>
                                                                <td bgcolor="#888895" height="17" colspan="2"></td>
                                                        </tr>
                                                        <tr>
                                                                <td bgcolor="#888895">
                                                                        <img
src="%sgraphics/webhead_notifications.gif" width="305" height="60" alt="">
                                                                </td>
                                                                <td width="202" height="60" bgcolor="#888895">
                                                                </td>
                                                        </tr>
                                                        <tr>
                                                                <td colspan="2">
                                                                </td>
                                                        </tr>
                                                        </table>
                                                </td>
                                        </tr>
                                        <tr>
                                                <td width="100%%" height="100%%" align="center" valign="top"
bgcolor="#ffffff" colspan="3">
                                                        <br/>
                                                        %s<br/>
                                                        <img alt="IPS Plot" src="cid:ipsplot" />
                                                        <br/>
                                                        ', $url, $url, $url, $url, $url, $url, $url, $formatted_details);
                        if($this->elements['plot_type'] != 'bar_plot') {
                                        $this->html_body .= '<table bgcolor="#000000" border="0"
cellpadding="1" cellspacing="0"><tr><td>
                                                        <table border="0" cellpadding="1" cellspacing="0"
bgcolor="#ffffff">
                                                                <tr><td colspan="3"
align="center"><h4>Legend</h4></td></tr>';
                                if($this->elements["metric_type"] == 'device') {
                                                $metric_alias = $this->elements['device_alias'].' - '.$this-
>elements['metric_name'];
```

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                            }
                    elseif($this->elements["metric_type"] == 'interface') {
                            $metric_alias = $this->elements['device_alias'].' - '.$this-
>elements['interface_alias'].' - '.$this->elements['metric_name'];
                    }
                    elseif($this->elements["metric_type"] == 'vip') {
                            $metric_alias = $this->elements['device_alias'].' - '.$this-
>elements['vip_alias'].' - '.$this->elements['metric_name'];
                    }
                    elseif($this->elements["metric_type"] == 'tunnel') {
                            $metric_alias = $this->elements['tunnel_alias'].$this-
>elements['tunnel_entry_alias'].' - '.$this->elements['metric_name'];
                    }
                    $metric_alias .= ' ('.$this->elements['adjusted_unit'].')';
                    $this->html_body .= '<tr>';
                    $this->html_body .= '<td><img src="'.$url.'graphics/legend_0.gif'
alt=""></td>';
                    $this->html_body .= '<td style="font: 10px Arial, Sans-
Serif;">'.$metric_alias.'</td></tr>';


                    //output mdr
                    $this->html_body .= '<tr>';
            $this->html_body .= '<td><img src="'.$url.'graphics/legend_1.gif' alt=""></td>';
            $this->html_body .= '<td style="font: 10px Arial,Sans-Serif;">Median Data Range -
85%</td>';
            $this->html_body .= '</tr>';
                $this->html_body .= '<tr>';
            $this->html_body .= '<td><img src="'.$url.'graphics/legend_2.gif' alt=""></td>';
            $this->html_body .= '<td style="font: 10px Arial,Sans-Serif;">Median Data Range -
95%</td>';
            $this->html_body .= '</tr>';
                $this->html_body .= '<tr>';
            $this->html_body .= '<td><img src="'.$url.'graphics/legend_3.gif' alt=""></td>';
            $this->html_body .= '<td style="font: 10px Arial,Sans-Serif;">Median Data Range -
99%</td>';
            $this->html_body .= '</tr>';


                    $this->html_body .= '</table></tr></td></table><br>';

                    $this->html_body .= sprintf('
                    </td></tr>');
                } else {
                    $this->html_body .= sprintf('<table bgcolor="#000000" border="0"
cellpadding="0" cellspacing="0"><tr><td align="center"><img src="%sgraphics/avail_legend.png"
alt=""></td></tr></table>', $url);
                }
                    $this->html_body .= '<tr><td width="100%" colspan="3">'.$this-
>event_log."<br></td></tr>";
                    $this->html_body .= sprintf('
                    <tr style="height:10">
                            <td align="center" width="100%%" valign="top" bgcolor="#3c60aa"
colspan="3">
                                    <img src="%sgraphics/copyright_label.gif" alt="Copyright
image">
                            </td>
                    </tr>
```

```php
                        </table>
                    </div>
            </body>
</html>', $url);
            }

        function send() {
                // send an individual notification
                $mail = new PHPMailer();
                if($this->notification_type == 'email') {
                        if ($this->gcid) {
                                $mail-
>AddEmbeddedImage($GLOBALS['ini_config']['graphcache']."/ips_".$this->gcid.".png", "ipsplot", $this-
>gcid.".png");
                        }
                        $mail->Subject = sprintf(
                                "%s - Alert [ID:%d%s]",
                                ucwords($this->elements["verdict"]),
                                $this->elements["monitor_id"],
                                $this->elements["account_name"]
                        );
                        $mail->FromName = "IP Sciences";
                        $mail->From = "support@ipsciences.com";
                        $mail->Body = $this->html_body;
                        $mail->AltBody = $this->text_body;
                }
                else {
                        $mail->FromName = "IPS";
                        $mail->From = "support@ipsciences.com";
                        $mail->Subject = "";
                        $mail->Body = $this->page_body;
                        $mail->AltBody = "";
                }

                $mail->AddAddress($this->recipient);
                $mail->Host = "localhost";
                $mail->Mailer = "smtp";

                if(!$mail->Send()) {
                        echo "Message was not sent";
                        echo "Mailer Error: ".$mail->ErrorInfo;
                }

                return 1;
        }
}


class Notification {
        var $elements = Array();

        function init($complete_notification) {
                // initialize the elements of the notification
                $this->elements = $complete_notification;
        }
        function grab_attributes() {
```

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// grab notification attributes
$status = $this->elements["escalation"];

$tertiary_level = (
        10 + $this->elements["primary_escalation_delay"]
        + $this->elements["secondary_escalation_delay"]
        + $this->elements["tertiary_escalation_delay"]
);

$secondary_level = (
        5 + $this->elements["primary_escalation_delay"]
        + $this->elements["secondary_escalation_delay"]
);

$primary_level = $this->elements["primary_escalation_delay"];

$this->notification_email = 0;
$this->notification_page = 0;
if ($status > $tertiary_level) {

        $this->escalation_level = "tertiary";

        if ($this->elements["tertiary_email"]) {
                $this->email_contact = $this->elements["tertiary_email"];
                $this->notification_email = 1;
        }

        if ($this->elements["tertiary_pager"]) {
                $this->pager_contact = $this->elements["tertiary_pager"];
                $this->notification_page = 1;
        }

}
if (
        ($this->notification_email == 0)
        && ($this->notification_page == 0)
        && ($status > $secondary_level)
) {

        $this->escalation_level = "secondary";

        if ($this->elements["secondary_email"]) {

                $this->email_contact = $this->elements["secondary_email"];
                $this->notification_email = 1;
        }
        if ($this->elements["secondary_pager"]) {

                $this->pager_contact = $this->elements["secondary_pager"];
                $this->notification_page = 1;
        }
}
if (
        ($this->notification_email == 0)
        && ($this->notification_page == 0)
        && ($status > $primary_level)) {
```

```php
                    $this->escalation_level = "primary";

                    if ($this->elements["primary_email"]) {
                            $this->notification_email = 1;
                            $this->email_contact = $this->elements["primary_email"];
                    }
                    if ($this->elements["primary_pager"]) {
                            $this->notification_page = 1;
                            $this->pager_contact = $this->elements["primary_pager"];
                    }
            }
            else {
                    $this->escalation_level = "none";
            }
    }

    function mark_sent() {
            // mark the notification sent
            $sql_mark_sent_notification = sprintf(
                    "UPDATE error_log SET timestamp = timestamp, notified = 1 WHERE
error_log_id=%d AND error_log_server_id=%d",
                    $this->elements['error_log_id'], $this->elements['error_log_server_id']);
            mysql_query($sql_mark_sent_notification);
    }

    function send() {
            // send notifications
            $error = 0;
            if ($this->notification_email) {
                    $email_notification = new Message();
                    $email_notification->init(
                            $this->elements, $this->email_contact,
                            'email');
                    $email_notification->build();
                    if($email_notification->send()) {
                            $error = 0;
                    }
            }
            if ($this->notification_page) {
                    $email_notification = new Message();
                    $email_notification->init(
                            $this->elements, $this->pager_contact,
                            'page');

                    $email_notification->build();
                    if($email_notification->send()) $error = 0;
            }
            if ($error == 0) return 1;
            else return 0;
    }
}


function send_notifications($notification_objects) {
        // Send the notifications (one at a time in serial)
```

```
            foreach ($notification_objects as $notification_object) {
                    $notification_object->grab_attributes();
                    if($notification_object->send()) {
                            $notification_object->mark_sent();
                    }
            }
    }
}

function run() {
        // Run the notifications engine
        $notification_objects = Array();
        $sql_get_notifications = "SELECT DISTINCT error_log.*, DATE_FORMAT(error_log.timestamp,
'%Y%m%d%H%i%s') AS event_log_timestamp,
rule.*, rule_monitor.*, monitor.*, user.*, account.*, metric.*
FROM error_log, rule, rule_monitor, monitor, user, account, metric
WHERE error_log.notified = 0
AND rule.rule_id=error_log.rule_id
AND rule.rule_server_id=error_log.rule_server_id
AND rule_monitor.rule_id=rule.rule_id
AND rule_monitor.rule_server_id=rule.rule_server_id
AND rule_monitor.monitor_id=error_log.monitor_id
AND rule_monitor.monitor_server_id=error_log.monitor_server_id
AND monitor.monitor_id = rule_monitor.monitor_id
AND monitor.monitor_server_id = rule_monitor.monitor_server_id
AND metric.metric_id = monitor.metric_id
AND metric.metric_server_id = monitor.metric_server_id
AND user.user_id = rule.user_id
AND user.user_server_id = rule.user_server_id
AND account.account_id = user.account_id
AND account.account_server_id = user.account_server_id ORDER BY error_log.timestamp ASC";


        $queried_notifications = mysql_query($sql_get_notifications);

        while ($notification = mysql_fetch_assoc($queried_notifications)) {
                $complete_notification = $notification;
                if($complete_notification["metric_type"] == "device") {
                        $sql_complete = sprintf(
                                "SELECT monitor_device.*, device.* FROM monitor_device, device
WHERE monitor_device.monitor_id=%d
AND monitor_device.monitor_server_id=%d
AND device.device_id=monitor_device.device_id
AND device.device_server_id=monitor_device.device_server_id",
                                $complete_notification["monitor_id"],
$complete_notification["monitor_server_id"]);
                }
                elseif($complete_notification["metric_type"] == "interface") {
                        $sql_complete = sprintf(
                                "SELECT monitor_interface.*, interface.interface_alias,
interface.interface_number, device.*
FROM monitor_interface, interface, device
WHERE interface.interface_id=monitor_interface.interface_id
AND interface.interface_server_id=monitor_interface.interface_server_id
AND device.device_id=interface.device_id
AND device.device_Server_id=interface.device_server_id
AND monitor_interface.monitor_id=%d
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AND monitor_interface.monitor_server_id=%d", $complete_notification["monitor_id"],
$complete_notification['monitor_server_id']);
                }
                elseif($complete_notification["metric_type"] == "vip") {
                        $sql_complete = sprintf(
                                "SELECT monitor_vip.*, vip.vip_alias, device.*
FROM monitor_vip, vip, device
WHERE vip.vip_id = monitor_vip.vip_id
AND vip.vip_server_id = monitor_vip.vip_server_id
AND device.device_id=vip.device_id
AND device.device_server_id=vip.device_server_id
AND monitor_vip.monitor_id =%d
AND monitor_vip.monitor_server_id=%d", $complete_notification["monitor_id"],
$complete_notification["monitor_server_id"]);
                }
                elseif($complete_notification["metric_type"] == "tunnel") {
                        $sql_complete = sprintf(
                                "SELECT monitor_tunnel.*, tunnel.tunnel_alias,
tunnel_entry.tunnel_entry_alias
FROM monitor_tunnel, tunnel, tunnel_entry, tunnel_side
WHERE monitor_tunnel.monitor_id=%d
AND monitor_tunnel.monitor_server_id=%d
AND tunnel_side.tunnel_side_id=monitor_tunnel.tunnel_side_id
AND tunnel_side.tunnel_side_server_id=monitor_tunnel.tunnel_side_server_id
AND tunnel_entry.tunnel_entry_id=tunnel_side.tunnel_entry_id
AND tunnel_entry.tunnel_entry_server_id=tunnel_side.tunnel_entry_server_id
AND tunnel.tunnel_id=tunnel_side.tunnel_id
AND tunnel.tunnel_server_id=tunnel_side.tunnel_server_id", $complete_notification["monitor_id"],
$complete_notification["monitor_server_id"]);
                }
                $queried_notification_data = mysql_query($sql_complete);
                $more_data = mysql_fetch_assoc($queried_notification_data);
                foreach(array_keys($more_data) as $key) {
                        $complete_notification[$key] = $more_data[$key];
                }
                $notification_object = new Notification();
                $notification_object->init($complete_notification);
                $notification_objects[] = $notification_object;
        }

        send_notifications($notification_objects);
}

run();
?>
```